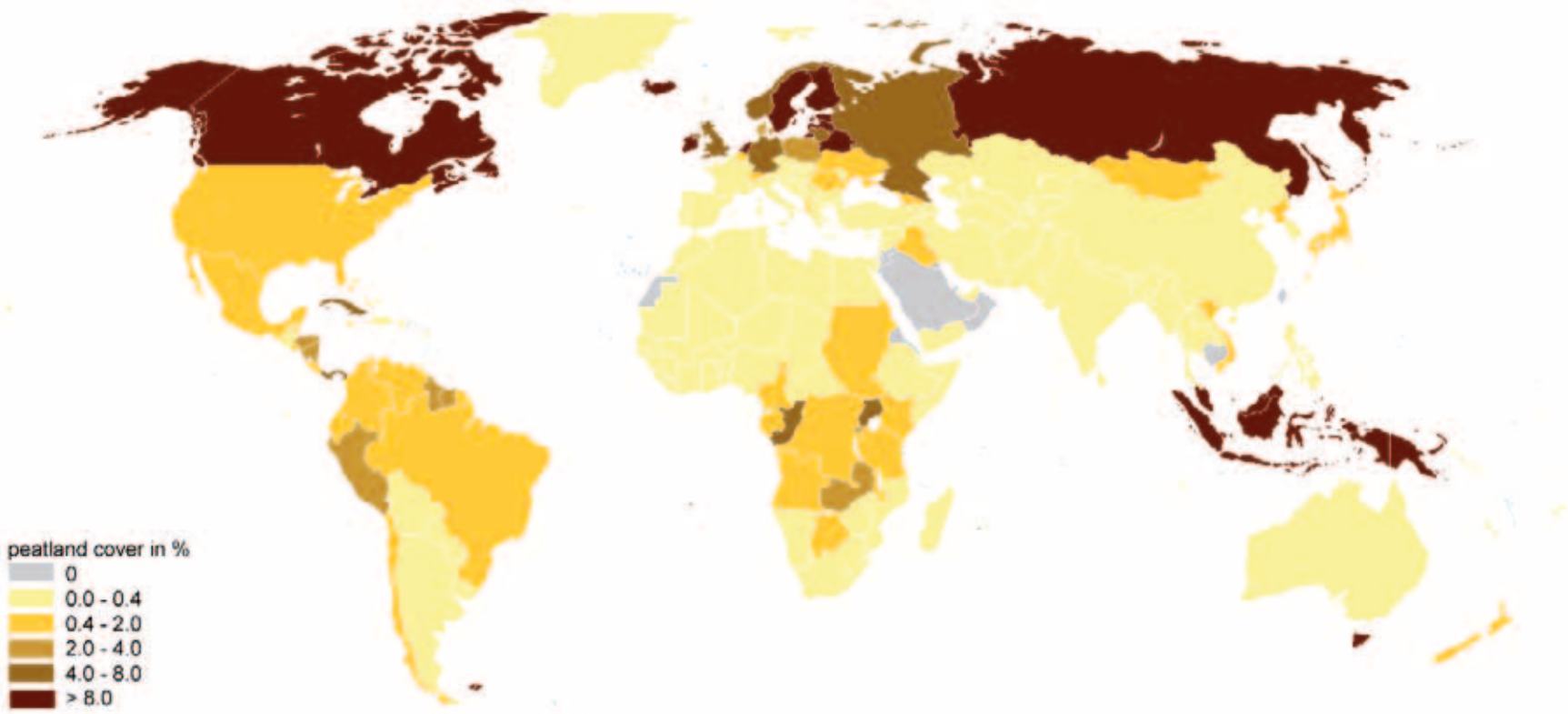
The Global Peatland CO_2 Picture

Peatland status and drainage related emissions in all countries of the world



WETLANDS INTERNATIONAL

The Global Peatland CO_2 Picture

Peatland status and drainage related emissions in all countries of the world

Hans Joosten, Greifswald University
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www.wetlands.org

Summary

Peatland drainage results in substantial emissions of carbon dioxide and nitrous oxide that urgently should be addressed in a post-2012 climate policy framework. The global figures presented until now do not clearly show the challenges and opportunities on regional and national levels. This report presents the first overview ever of peatland carbon data for all countries and regions of the world. This overview has been produced to facilitate the UN-FCCC climate negotiations in response to a call by countries for emission data caused by the Land Use Change and Forestry sector. For every country/area information is given on extent and status of peatlands, volume of the peat resource and on CO_2 emissions from different types of land use, both for the year 1990 as well as for the year 2008.

The inventory shows the global CO_2 emissions from drained peatlands have increased from 1 058 Mton in 1990 to 1 298 Mton in 2008 (> 20%). This increase has particularly taken place in developing countries of which Indonesia, China, Malaysia and Papua New Guinea are the fastest growing top emitters. This estimate excludes emissions from peat fires (conservative estimates amount to at least 400 Mton/CO_2-eq./yr for south-east Asia[1]) and also covers only heterotrophic decomposition of soil organic matter; root respiration is excluded. Annex 1 countries have reduced their peatland emissions since 1990 but are still responsible for more than 0.5 Gton of CO_2 emissions. With 174 Mton, the EU (27) is after Indonesia (500 Mton) and before Russia (161 Mton) the World's 2nd largest emitter of drainage related peatland CO_2 (excl. extracted peat and fires).

This new inventory shows that the responsibility for better peatland management for climate change mitigation is indeed global and not limited to a few selected countries. Inventory has to be improved, however, by:

- formulating clear definitions and standards for consistent inventory and reporting
- adopting a wall-to-wall peatland reporting scheme
- improved peatland mapping to cover important gaps, especially in tropical Africa, tropical South America, and South Asia.

Total CO_2 emissions from the worldwide 500 000 km^2 of degraded peatland may exceed 2 Gtons (including emissions from peat fires). Taking into account that only part of this area is available for rewetting and that CO_2 reduction may be partly annihilated by re-installed CH_4 emissions, peatland rewetting may globally reduce greenhouse gas emissions with several hundred Mton CO_2-eq./yr.

Whereas Annex 1 countries can stick to the base year 1990, this base year is clearly unfavourable for non-Annex 1 countries, where major peatland drainage has occurred since 1990.

[1] Other sources state 1400 Mt or even more (for instance: Hooijer, A., Silvius, M., Wösten, H. & Page, S. 2006. Peat-CO_2 - Assessment of CO_2 emissions from drained peatlands in SE Asia. Delft Hydraulics Report Q3943).

Introduction

Peatland drainage results in substantial emissions of carbon dioxide and nitrous oxide that should be addressed in a post-2012 climate policy framework. The global figures presented until now, however, (e.g. peat carbon pools of 550 Gtonnes C; annual emissions from degraded peatlands including fires of at least 2 Gtonnes CO_2 per year, Parish et al. 2008) do not clearly show the challenges and opportunities on regional and national levels, as they fail to highlight the different responsibilities of the various countries:

- To secure that pristine peatlands remain untouched, preventing their enormous carbon store from being mobilized (countries with much peatland and large volumes of peat);
- To implement rewetting programmes and use this attractive opportunity for climate change mitigation (countries with degraded peatlands);
- To conserve these landscapes as special components of biodiversity and as a source of palaeo-environmental information (countries where peatlands are rare);
- And - last but not least - to be aware of their peatland resource to pursue optimal and nationally differentiated climate policies (all countries).

This report presents the first overview ever of peatland carbon data for all countries and regions of the world. The report has been produced to facilitate the UN-FCCC climate negotiations in response to a call by countries for emission data caused by the Land Use Change and Forestry sector. A draft version was presented to the parties at the UNFCCC meetings in Bangkok (September/October 2009) and consequent corrections and comments are integrated in this version.

1. Methods

1.1. Scope

The data presented in the following tables are a summary of the information available in the International Mire Conservation Group Global Peatland Database (IMCG-GPD www.imcg.net/gpd/gpd.htm), where detailed descriptions and references for individual countries and areas can be found. The IMCG-GPD is in a continuous state of development and the data presented here are by necessity preliminary and incomplete. The absence of peatlands in Cambodia, for example, does not fit in the global picture and is probably caused by a lack of inventory. For many countries in Africa and South America there is a large uncertainty about the former and current extent of peatlands; this notably also applies to Australia.
The data presented deviate for some countries from national data, because we have chosen to apply similar standard methods and default values to all countries to allow for better comparison.

We hope that this first world table is received as a challenge and invitation for countries to improve their peatland inventory. For comments and additional information, contact Hans Joosten: info@imcg.net.

1.2. Coverage

The data are mainly presented for national states. Next to national states, other distinct and disjunct areas (e.g. Greenland, Spitsbergen/Svalbard, Tasmania), contested regions (e.g. Falklands/Malvinas, Jammu and Kashmir) and areas that do not belong to any country (e.g. all islands south of 60°S) are presented separately. The subdivision in 'continents' is pragmatically based on the availability of data (e.g. Papua/Irian Jaya is scheduled under Indonesia in 'Asia', whereas Papua New Guinea is allotted to 'Australasia'). For every country/area information is given on extent and status of peatlands, volume of the peat resource and on CO_2 emissions from different types of land use, both for the year 1990 and for the year 2008.

This overview concentrates on freshwater peatlands. Some peat accumulating or peat soil containing ecosystems are generally overlooked, because they are - erroneously - not considered to be peatlands or mires. Because of absence of information they are not sufficiently covered in this inventory. These ecosystems include

- **Mangroves**: Mangroves may form peat, comprised mainly of intertwined rootlets and soft (parenchymatous) parts of larger roots. They may furthermore collect allochtonous peat-like sediments. Peat accumulating mangroves are widely reported. In our overview we have only included them when the presence of peat was explicitly stated.
- **Salt marshes**: Outside the tropics, salt-marshes replace the mangroves. Salt-marsh peatlands with fibrous peat, consisting of the remains of plants that have grown in salt or brackish water, often mixed with considerable amounts of clay or silt, have been reported from both the east- and westcoast of North-America and from the Baltic Sea shores. Not all peat found under salt marshes has originated under salt marsh

conditions. The peat may also have been formed under freshwater conditions and covered by marsh sediments after a rise in sea level.

- **Paddies**: Especially in Southeast Asia peat soils have been reclaimed for rice cultivation and consequently often classified as paddy soils, not as organic soils. Because of intensive cultivation practise the peat may rapidly disappear. We have only included paddies when the presence of peat was explicitly stated.
- **Paludified forests**: In paludified forests paludification and peat formation have proceeded to such an extent that the soil is covered with a layer of peat, but the trees still largely root in the mineral subsoil. Paludified forests are often excluded from peatland inventories because they are regarded as 'forests', even when the peat layer exceeds 30 cm.
- **Cloud forests and elfin woodlands**: These forests in the humid tropics receive additional humidity, other than rainfall, through the capture and/or condensation of water droplets. In cloud forests the layer of practically undecomposed organic matter ('peat') may even reach more than four metres in depth.
- **Paramos**: Paramos are tropical ecosystems that occur between the upper limit of continuous, closed-canopy forest and the upper limit of plant life, i.e. between 3000 m and 5000 m. Locally these areas are known as 'zacatonales' (Mexico, Guatemala), 'páramo' (Central and northern South America), 'jalca' (northern Peru), 'puna' (drier areas of the altiplano of the central Andes), 'afroalpine' and 'moorland' (East Africa), and 'tropical-alpine' (Malesia). Swampy cushion mires or 'turberas' are common, especially in the uppermost grass páramo.
- **Dambos**: Dambos are seasonally or permanently wet grassy valleys, depressions or seepage zones on slopes. Locally they are known as 'bas-fonds' or 'marigots' (French speaking West and Central Africa), 'inland valleys' or 'bolis' (Sierra Leone), 'fadama' (Nigeria), 'vleis' (Afrikaans), 'bani' (Shona), 'mapani', 'mbugas' (Tanzania) or 'dambos' (Eastern and Southern Africa). Dambos partly contain organic soils ('dambo peats').
- **Cryosols**: Cryosols are perennially frozen mineral and organic soils. Cryosols dominate the Arctic regions, are widespread in the Subarctic, discontinuous in Boreal areas, and sporadic in more temperate mountainous regions. Cryosols are often associated with a significant accumulation of organic matter at the surface and with cryoturbated organic matter in the subsoil.

Submarine peatlands, i.e. peat deposits on the sea floor have not been taken into consideration as our inventories only concern present-day (semi-) terrestrial areas with peat at the surface. Submarine peatlands may be formed by seagrasses or have originated from former terrestrial peatlands that have been inundated by the rising sea levels during the Lateglacial and Holocene.

1.3. Definitions

For global comparison, we have tried to adjust the variety of existing data to uniform standards, using the following definitions (Joosten & Clarke 2002):
Peat is sedentarily accumulated material consisting of at least 30% (dry mass) of dead organic material. This criterion is consistent with common definitions. In various inventories, other (mostly higher) percentages of organic material are used. Higher percentages exclude sedentates with a high proportion of clastic material or carbonates, like in flood mires (incl. mangroves and salt marshes) and calcareous spring mires.
A **peatland** is an area with a naturally accumulated peat layer at the surface. To provide a uniform standard, the data concern peatlands with a minimum peat depth of 30 cm (historically based on ploughing depth). This criterion excludes many (sub)arctic and (sub)alpine areas with a shallow peat layer. The IMCG-GPD definition largely coincides with the FAO definition of histosols with the notable exception that the FAO definition includes areas with shallow peat layers over ice or rock (see Couwenberg 2009).
The IPCC (2006) Tier 1 guidance on monitoring changes in soil organic carbon for mineral soils addresses the stock in the upper 30 cm of the soil. Also from this perspective the 30 cm criterion is logical: Only if the peat layer is thicker than 30 cm the Tier 1 approach for mineral soils fails and default emission factors for organic soils must be used.
A **mire** is a peatland where peat is currently being formed and accumulating. In the literature, 'peatlands' or 'mires' have often been described as purely a vegetational concept, without reference to the presence of peat. These records have not been included.

1.4. Inventory and data reliability

Peatland inventory is until now unsatisfactory and most countries have insufficient information about their peatland resource. This is related foremost to the fact that the decisive feature 'presence of peat' can not be observed directly by remote sensing. On a regional scale peatland distribution can indeed be mapped by remote sensing and limited ground truthing (because of a fair correlation between vegetation structure and peat), but over larger areas the variety of peatlands is too large (varying from forest and shrubland to reeds, open grassland and moss stretches) to assess the presence of peatland merely on the basis of surficial landscape characteristics. This also prohibits an objective estimation of uncertainty levels (as would follow from field truthing verification of remote sensing

inventory). The data ranges presented in literature are thus no real reliability ranges but compilations of different estimates. For Bolivia we found, for example, reports of peatland occurrence varying from 9 km^2 (peatlands) to 14,256 km^2 (histosols). In the tables we do not present all these (often extremely dissimilar) estimates but present the most probable figure. Whereas on a regional scale peatland distribution can be mapped by remote sensing, this is impossible for peat carbon stocks. To assess peat thickness and volume we still fully rely on field peat mapping campaigns. These are for most countries not available. Even the country with the best data on peatland distribution, Finland, has only mapped a quarter of its peatland area in detail. If other data were absent and other depths were not plausible we have considered peatlands to have an average peat depth of 2 m. Overall, peat depth is estimated conservatively, which explains why the number for the total peatland carbon stock is lower than previous estimates (Kaat & Joosten 2008; Parish et al. 2008).

The data presented in the tables try to weigh up existing information from a variety of sources and to make an informed guess as to the actual situation. A consistent international overview of peatland/mire areas is complicated by the following, often interrelated, issues:

- **Typology**: Inventory and mapping of peatlands depend on interests (agriculture, forestry, peat extraction, conservation) and local classification traditions. Typologies and criteria therefore differ considerably from country to country, from discipline to discipline, from time to time and from object to object. In this first review, we have not yet succeeded in recalculating the diverse data to a uniform minimum peat depth standard of ≥ 30 cm.
  Differences in the concept of 'peat' were not considered as local inventories normally do not provide the necessary information. The different concepts of 'peat' with respect to organic matter content probably do not lead to strongly different global volumes of 'peat' and peat carbon stocks.
  For SE Asia peatland drainage for agriculture and for (agro-)forestry has been taken together under agriculture, because the aims cannot be clearly separated.
  A typological problem is also a failing standard to express volumes of extracted peat. These are generally presented in tonnes (e.g. for fuel) or in m^3 (for moss litter), but as the water content or the processing procedure (e.g. peat briquettes) may differ strongly, it is often unclear how the specific weight or volume in the statistics translates to carbon. The total amount of peat carbon extracted from European peatlands could not yet be established conclusively and this *considerable* source of carbon emission was thus left out of our estimates.
- **Scale**: Inventories only consider peatlands of a certain minimum extent, e.g. larger than 3, 10, or 100 ha, so that the aggregate data can not simply be compared. The FAO/UNESCO Soil Map of the World (SMW; 1: 5,000,000, 1974 - 1981) from which many older peatland distribution data in tropical countries are derived, has legend units that consist of associations of different soil types and that give no unequivocal picture of the distribution of histosols (i.e. organic or peat soils). We have used an improved interpretation of this map (Van Engelen & Huting 2002).
- **Time**: As the peatland area may change considerably in time because of mire expansion or peat oxidation/extraction, the data presented in inventories are only valid for a specific period. Drainage of peatlands leads to peat subsidence, oxidation and a decrease of the peat depth in time. When the peat layer becomes less than 30 cm thick, the area is - according to our inventory definition - no peatland anymore. For temperate peatlands an annual rate of peatland area decrease of 0.5 % can be deduced (conservatively) in case of drainage for agriculture or peat extraction. This conservative value was used to reconstruct the distribution of drained peatlands for the years 1990 and 2008 when (as in most cases) only inventory data from other years were available.
- **Changing national borders and names**: National borders have been changing considerably in the 19th and 20th century, particularly in Europe, complicating the use of older inventories. We present the data according to the present borders of the countries involved.
- **Units**: It appears that in literature the same or similar abbreviations are used for different units. MT (= metric tonnes), for example, has been confused with Mtons (Mega-tons = 1,000,000 MT), whereas Mtons has also confusingly be used to express 1,000 tons.
  Acres have been mixed up with hectares, hectares (cf. hm^2) with km^2, etc. Pseudo-exactness is introduced through recalculation of figures in the metric system. A quoted area of 2,328 ha for the Negril Morass in Jamaica, for example, gives the impression of being much more exactly assessed than the original figure of 6,000 acres.
- **Errors**: It is inevitable that calculation and printing mistakes and quotation mistakes have entered in the reporting of inventories (we will have generated some new ones…). In various cases these will have remained unnoticed, but where possible we have corrected them.
- **Error repetition**: In most literature, the facts and figures presented are copied from older literature and 'recycled' through a number of publications without checking, discussing or referring to the inventory techniques, the level of accuracy, and the (often very different) concepts used to arrive at the data. We have tried to reconstruct the 'quotation pathway' in order to arrive at the 'original' source of the data presented. In a quotation sequence the data may be expected to become less

unreliable as with every consecutive citation more people (should…) have given consideration to their probability. Special attention is paid in this respect to key publications that are often cited for peatland distribution data.

- **Confusion between geographical areas and nations**: These have been observed in data for Great Britain/United Kingdom, Japan, New Zealand, and may have occurred with countries with changing names (Congo - Zaire - Congo, Pakistan - Bangladesh), and between areas or countries with similar names (cf. the various Guyanas and Guineas).

The figures provided are best professional judgement based on a wide review of the available literature and on ample field experience in all continents and climate zones of the world.

1.5. Emission factors

The calculated emissions only concern emissions from biological oxidation of peat. Emissions from fires are not included. Default emission factors for CO_2 (table 1) are derived from Couwenberg (2009) or based on interpolations and educated estimates. Only emissions from drained peatlands are included, CO_2 and CH_4 fluxes in pristine peatlands are - following the UNFCCC philosophy - not addressed.

Drained peatlands hardly emit CH_4, whereas the anthropogenic CH_4 emissions in rewetted peatlands are assumed to be outbalanced by reduced CO_2 emissions. In rice fields on peat soil, CH_4 emissions are largely derived from young plant material, while the role of the peat soil as a substrate for CH_4 production is likely limited in light of the recalcitrance of tropical peat (Couwenberg et al. 2009).
Whereas they may be substantial, emissions of N_2O are not accounted because good proxies are lacking for the rather erratic fluxes that largely depend on amount and timing of fertilizer application.

Table 1: Default values used for CO_2 emissions from drained peat soils (in t CO_2 ha^{-1} yr^{-1}).

	Forest land / Agroforestry	Cropland	Grassland	Extraction sites
Tropical	**40**	**40**	**40**	**30**
Subtropical	*30*	*35*	*30*	*25*
Temperate	*20*	*25*	**20**	*15*
Boreal	**7**	**25**	**10**	**10**

Figures derived from Couwenberg (2009)*, *interpolated*

* This paper evaluates IPCC approaches to GHG emissions from managed organic (peat soils) and concludes with a summary table comparing IPCC 2006 default values with best estimates based on recent literature.

2. Some results

The wealth of information in the tables has not yet been fully exploited. Exemplarily we present a new table of the countries/areas with the largest peatland occurrences (table 2). This table confirms the findings of earlier overviews that Russia, Canada, Indonesia and USA are leading.

Table 2: The countries/areas with the actual largest peatland occurrences.

Country/area	Peat area (km^2)
Russia - Asian part	1 176 280
Canada	1 133 926
Indonesia	265 500
Russia - European part	199 410
USA (Alaska)	131 990
USA (lower 48)	91 819
Finland	79 429
Sweden	65 623
Papua New Guinea	59 922
Brazil	54 730
Peru	49 991
China	33 499
Sudan	29 910
Norway	29 685
Malaysia	26 685
Mongolia	26 291
Belarus	22 352
United Kingdom	17 113
Germany	16 668
Congo	15 999
Zambia	15 410
Uganda	13 640
Iceland	13 366
DR Congo	11 955
Poland	11 528
Falklands - Malvinas	11 408
Ireland	11 090
Chile	10 996

Below table shows that various sub-Antarctic isles have the worldwide largest proportion of peatlands.

Table 3: The countries/areas with the actual largest peatland proportion (% of total land area area).

Country/area	Peatland (proportion %)
Falklands / Malvinas	93.7
Antipodes	81.8
Campbell Islands	70.4
Auckland Islands	70.2
St Helena	53.3
Amsterdam & St-Paul Islands	48.4
Macquarie Island	46.9
Chatham Islands	46.7
Tristan da Cunha	32.2
Finland	23.5
Singapore	21.2
Estonia	20.9
Ireland	15.8
Sweden	14.6
Tasmania	14.5
Indonesia	13.9
Iceland	13.0
Papua New Guinea	12.9
Canada	11.4
Belarus	10.8
Latvia	10.0
Îles Crozet	9.2
USA (Alaska)	8.7
Russia - Asian part	8.7
Netherlands	8.3
Malaysia	8.1
Norway	7.7
Trindade Island (Brazil)	7.1

For a whole series of countries/areas the occurrence of peatlands could not (yet) be confirmed. Table 4 presents an overview of countries/areas from which peatlands are known, but where they are extremely rare and deserve further research and conservation.

Table 4: The countries/areas with the smallest known peatland occurrences (as percentage of their area).

Country/area	Peatland (proportion %)
Yemen	0.0002
Algeria	0.0004
Greenland	0.0005
Tajikistan	0.0007
Chad	0.0007
Egypt	0.0010
United Arab Emirates	0.0011
Tunisia	0.0012
Syria	0.0015
Kazakhstan	0.0018
Morocco	0.0021
Bhutan	0.0021
Mauritius	0.0024
Haiti	0.0033
Croatia	0.0034
South Shetland Islands	0.0043
South Korea	0.0047
New Caledonia and Dep.	0.0052
Mauritania	0.0056
Libya	0.0056
Niger	0.0060
Nepal	0.0065
Lebanon	0.0087
Bolivia	0.0090
Cyprus	0.0108
Spain	0.0112
Namibia	0.0120
Australia (excl. Tasmania)	0.0121
Galápagos Islands	0.0127
Turkey	0.0154

The 'top-emittors' (table 5) indeed include SE Asia, Central and Eastern Europe, and the USA (lower 48). Big emittors that until now were less apparent are China and Mongolia. Note that emissions from peat extraction are not included in the calculations for European countries.

Table 5: The countries/areas with the actual largest total emissions from degrading peat in 2008.

Country/area	Emissions from degrading peat 2008 (Mton CO_2/a)
Indonesia	500
Russia European part	139
China	77
USA (lower 48)	67
Finland	50
Malaysia	48
Mongolia	45
Belarus	41
Germany	32
Poland	24
Russia Asian part	22
Uganda	20
Papua New Guinea	20
Iceland	18
Sweden	15
Brazil	12
United Kingdom	10
Estonia	10
Ireland	8
Lithuania	6
Netherlands	6
Norway	6
Vietnam	5
Ukraine	5
Zambia	5
Japan	5
Canada	5
Latvia	4

Table 6: The countries/areas with the actual largest peat carbon stocks (Mton C) 2008.

Country	Peat carbon stock 2008 (Mton C)
Canada	154 972
Russia Asian part	117 607
Indonesia	54 016
Russia European part	19 948
USA (Alaska)	15 499
USA (lower 48)	13 668
Papua New Guinea	5 983
Brazil	5 440
Malaysia	5 431
Finland	5 294
Sweden	5 000
China	3 224
Norway	2 230
Germany	2 018
Venezuela	1 984
Sudan	1 980
United Kingdom	1 745
Congo	1 600
Mexico	1 483
Uganda	1 321
Belarus	1 305
Dem. Republic of the Congo	1 190
Falkland Islands / Islas Malvinas	1 151
Ireland	1 130
Chile	1 124
Colombia	1 000
Peru	998
Angola	980

Previous estimates of global peatland area (~4 million km^2; Kaat & Joosten 2008) correspond well with the present country-wise data (often based on conservative estimates). The carbon stock estimate is likely too low following our conservative approach. Total emissions of 1.3 Gton do not include the considerable source of emission caused by peat fires, regularly occurring in south-east Asia (conservative estimates amount to at least 400 Mton/CO_2-eq./yr*), Russia, Belarus and other countries. This estimate also covers only heterotrophic decomposition of soil organic matter; root respiration is excluded.

The global CO_2 emissions from drained peatland have strongly increased since 1990. Leaving aside above-mentioned emissions from peat extraction and fires, global CO_2 emissions from drained peatland have increased from 1,058 Mton in 1990 to 1,298 Mton in 2008. This 240 Mton increase is equivalent to > 20% of the 1990 emissions.

Since 1990 peatland emissions have increased in 45 countries, of which 40 developing countries. A more than 50% increase in emission was found for: Papua New Guinea, Malaysia, Burundi, Indonesia, Kenya, Gabon, Togo, Trinidad and Tobago, Dominican Republic, Colombia, Rwanda, Brunei, Ethiopia, Guatemala. These top-growers include with Indonesia, China, Malaysia and Papua New Guinea some of the top emittors in the World.

According to our figures the Annex 1 countries emit ~0.5 Gton CO_2 from ~250,000 km^2 of drained peatland (excl. extracted peat and fires). These emissions seem to have decreased from 655 Mton in 1990 to 492 Mton in 2008, i.e. a decrease of ~25% compared to 1990. Part of these reductions, however, only emerge because peatlands abandoned since 1990 have wrongly disappeared from the reporting, especially in Eastern Europe.

With 174 Mton, the EU (27) is after Indonesia (500 Mton) and before Russia (161 Mton) the World's 2nd largest emitter of CO_2 from drained peatland (excl. extracted peat and fires) .These emissions have decreased from 191 to 174 Mton (~ -10%). since 1990.

3. Some conclusions

This new inventory shows that the responsibility for better peatland management for climate change mitigation is indeed global and not limited to a few selected countries.

Inventory has to be improved by

- formulating clear definitions and standards for consistent inventory and reporting
- adopting a wall-to-wall peatland reporting scheme to avoid that important peatland areas fall outside the reporting (e.g. abandoned agricultural and extraction sites when shifting from one land use category to the other, as often happens in Europe)
- global peatland mapping to cover important gaps, especially in tropical Africa, tropical South America, and South Asia.

Total CO_2 emissions from the worldwide 500,000 km^2 of degraded peatland exceed 2 Gtons. Even when taking into account that only part of this area is available for rewetting and that a considerable part of the CO_2 reduction may be annihilated by re-installed CH_4 emissions, it may be expected that peatland rewetting may globally reduce greenhouse gas emissions with several hundred Mton CO2-eq./yr.
This large reduction opportunity exists for both Annex 1 and non-Annex 1 countries. Whereas Annex 1 countries can stick to the base year 1990, because peatland emissions have decreased in these countries since 1990, this base year is clearly unfavourable for non-Annex 1 countries, where major peatland drainage has occurred since 1990. For the latter a base year 2008 ('after Bali'…) should be chosen to make peatland rewetting to an attractive climate change mitigation option.

4. Acknowledgements

The data presented in this overview have been gathered by a wide range of persons of which especially the contributions of graduates and postgraduates of Greifswald University and the members of the International Mire Conservation Group have to be acknowledged.

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Tables

Country list of CO_2 emissions from degraded peatlands AFRICA

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
AFRICA	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Algeria	2 381 741	10	1	0	0.01	0	0	0	0.01	2	0	**0.01**
Angola	1 246 700	10 000	1 000	9 000	4	0	0.02	0	4.0	1 005	0.04	**4.1**
Benin	112 622	100	10	10	0.2	0	0	0	0.2	50	0	**0.2**
Botswana	581 730	3 000	300	0	0.4	0	0	0	0.4	100	0	**0.4**
Burkina Faso	274 200	150	15	50	0.2	0	0	0	0.2	50	0	**0.2**
Burundi	27 834	150	70	10	0.06	0	0.01	0	0.1	17	0.02	**0.1**
Cameroon	475 442	4 000	400	3 900	0.4	0	0	0	0.4	100	0	**0.4**
Canary Islands	7 273	0	0	0	0	0	0	0	0	0	0	**0**
Cape Verde	4 033	0	0	0	0	0	0	0	0	0	0	**0**
Central African Republic	622 436	100	10	50	0.04	0	0	0	0.04	10	0	**0.04**
Ceuta	28	0	0	0	0	0	0	0	0	0	0	**0**
Chad	1 284 000	10	1	0	0.02	0	0	0	0.02	5	0	**0.02**
Comoros	1 862	0	0	0	0	0	0	0	0	0	0	**0**
Congo	342 000	16 000	1 600	12 000	0.04	0	0	0	0.04	10	0	**0.04**
Dem. Republic of the Congo	2 344 885	12 000	1 200	10 000	2	0	0	0	2	500	0	**2**
Djibouti	23 200	55	6	40	0.06	0	0	0	0.06	15	0	**0.06**
Egypt	997 739	10	1	0	0.02	0	0	0	0.02	5	0	**0.02**
Equatorial Guinea	28 051	8	1	6	0.01	0	0	0	0.01	2	0	**0.01**
Eritrea	121 144	0	0	0	0	0	0	0	0	0	0	**0**
Ethiopia	1 133 380	2 200	220	100	0.4	0	0	0	0.4	100	0	**0.4**
Gabon	267 667	2 000	200	1 900	0.04	0	0	0	0.04	10	0	**0.04**
Ghana	238 500	100	10	50	0.08	0	0	0	0.08	20	0	**0.1**
Guinea	245 857	1 000	50	500	2	0	0	0	2	500	0	**2**
Guinea-Bissau	36 125	15	2	10	0.02	0	0	0	0.02	5	0	**0.02**
Ivory Coast	322 462	700	70	350	1	0	0	0	1	250	0	**1**
Kenya	582 646	5 000	500	2 000	2	0	0	0	2	500	0	**2**
Lesotho	30 355	20	2	0	0.05	0	0	0	0.05	13	0	**0.05**
Liberia	99 067	100	3	50	0.1	0	0.003	0	0.1	31	0.0004	**0.1**
Libya	1 757 000	100	5	0	0.04	0	0	0	0.04	10	0	**0.04**
Madagascar	587 041	1 900	190	900	2	0	0.03	0	2.0	510	0	**2.0**

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Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**AFRICA**
10	1	0	0.007	0	0	0	0.007	2	0	**0.007**	3	Algeria
9 910	980	9 000	4	0	0.03	0	4.0	1 010	0.04	**4.1**	3 228	Angola
96	9	10	0.2	0	0	0	0.2	50	0	**0.2**	30	Benin
2 991	298	0	0.4	0	0	0	0.4	100	0	**0.4**	982	Botswana
146	14	50	0.2	0	0	0	0.2	50	0	**0.2**	46	Burkina Faso
148	70	5	0.2	0	0.01	0	0.2	63	0.01	**0.3**	229	Burundi
3 991	398	3 900	0.4	0	0	0	0.4	100	0	**0.4**	1 311	Cameroon
0	0	0	0	0	0	0	0	0	0	**0**	0	Canary Islands
0	0	0	0	0	0	0	0	0	0	**0**	0	Cape Verde
99	10	50	0.04	0	0	0	0.04	10	0	**0.04**	32	Central African Republic
0	0	0	0	0	0	0	0	0	0	**0**	0	Ceuta
10	1	0	0.02	0	0	0	0.02	5	0	**0.02**	3	Chad
0	0	0	0	0	0	0	0	0	0	**0**	0	Comoros
15 999	1 600	12 000	0.04	0	0	0	0.04	10	0	**0.04**	5 270	Congo
11 955	1 190	10 000	2	0.4	0	0	2	600	0	**2.4**	3 920	Dem. Republic of the Congo
54	5	35	0.07	0	0	0	0.1	18	0	**0.1**	17	Djibouti
10	0.9	0	0.02	0	0	0	0.02	5	0	**0.02**	3	Egypt
8	0.8	6	0.01	0	0	0	0.01	2	0	**0.01**	3	Equatorial Guinea
0	0	0	0	0	0	0	0	0	0	**0**	0.000	Eritrea
2 191	218	100	0.5	0	0	0	0.5	150	0	**0.5**	719	Ethiopia
1 999	200	1 900	0.08	0	0	0	0.1	20	0	**0.1**	658	Gabon
98	10	50	0.08	0	0	0	0.1	20	0	**0.1**	32	Ghana
955	40	450	2	0	0	0	2	500	0	**2**	132	Guinea
15	1	9	0.02	0	0	0	0.02	5	0	**0.02**	5	Guinea-Bissau
678	65	300	1.2	0	0	0	1.2	300	0	**1.2**	214	Ivory Coast
4 900	490	2 000	4	0	0	0	4	1 000	0	**4**	1 615	Kenya
19	2	0	0.06	0	0	0	0.06	16	0	**0.06**	6	Lesotho
97	2	40	0.2	0	0.003	0	0.2	41	0.0004	**0.2**	8	Liberia
99	5	0	0.04	0	0	0	0.04	10	0	**0.04**	16	Libya
1 854	180	800	2.4	0	0.03	0	2.4	610	0	**2.4**	593	Madagascar

Country list of CO_2 emissions from degraded peatlands AFRICA

	1990											
Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
AFRICA (ctd)	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Madeiras (Portugal)	794	0	0	0	0	0	0	0	0	0	0	**0**
Malawi	118 484	700	70	100	1.2	0	0	0	1.2	300	0	**1.2**
Mali	1 240 192	400	40	50	0.2	0	0	0	0.2	50	0	**0.2**
Mauritania	1 031 000	60	6	20	0.1	0	0	0	0.1	30	0.0004	**0.1**
Mauritius	2 040	0.05	0.01	0.02	0.0001	0	0	0	0.0001	0.02	0	**0.0001**
Melilla	12	0	0	0	0	0	0	0	0	0	0	**0**
Morocco	453 730	10	1	0	0.02	0	0	0	0.02	5	0	**0.02**
Mozambique	799 380	2 000	200	1000	3	0	0	0	3	750	0	**3**
Namibia	824 269	100	10	0	0.04	0	0	0	0.04	10	0	**0.04**
Niger	1 267 000	76	2	0	0	0	0	0	0	0	0	**0**
Nigeria	923 768	1 100	110	900	0.8	0	0	0.04	0.8	210	0	**0.8**
Réunion	2 512	120	9	50	0.08	0	0	0	0.08	20	0	**0.08**
Rwanda	26 338	800	120	10	0.4	0	0.01	0	0.4	104	0.03	**0.4**
São Tomé and Príncipe	1 001	2	0	0	0.004	0	0	0	0.004	1	0	**0.004**
Senegal	196 722	55	14	45	0.02	0	0.0003	0	0.02	6.1	0.04	**0.06**
Sierra Leone	71 740	100	5	50	0.1	0	0.003	0	0.1	31	0.0004	**0.1**
Somalia	637 700	200	20	10	0.2	0	0	0	0.2	50	0	**0.2**
South Africa	1 219 090	300	60	100	0.2	0	0.003	0	0.2	51	0.02	**0.2**
Sudan	2 505 800	30 000	2 000	0	4	0	0	0	4	1 000	0	**4**
Swaziland	17 363	50	5	0	0.1	0	0	0	0.1	30	0	**0.1**
Tanzania	945 100	4 500	250	500	0.3	0	0	0	0.3	80	0	**0.3**
The Gambia	11 295	50	1	30	0.08	0	0	0	0.08	20	0	**0.08**
Togo	56 785	30	3	5	0.04	0	0	0	0.04	10	0	**0.04**
Tunisia	164 418	2	0.2	0	0.004	0	0	0	0.004	1	0	**0.004**
Western Sahara	252 120	0	0	0	0	0	0	0	0	0	0	**0**
Uganda	241 138	14 000	1 400	1 500	16	0	0	0	16	4 000	0	**16**
Zambia	752 614	15 500	800	1 000	4	0	0	0	4	1 000	0	**4**
Zimbabwe	390 759	350	20	50	0.8	0	0	0	0.8	200	0	**0.8**
AFRICA TOTAL	**30 332 174**	**129 233**	**11 012**	**46 346**	**47**	**0**	**0.1**	**0**	**47**	**11 779**	**0**	**47.2**

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WETLANDS INTERNATIONAL

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km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**AFRICA (ctd)**
0	0	0	0	0	0	0	0	0	0	**0**	0	Madeiras (Portugal)
673	64	100	1.2	0	0	0	1.2	300	0	**1.2**	211	Malawi
396	39	50	0.2	0	0	0	0.2	50	0	**0.2**	129	Mali
57	5	20	0.12	0	0.003	0	0.1	31	0.0007	**0.1**	18	Mauritania
0	0	0.02	0.0001	0	0	0	0.0001	0.02	0	**0.00008**	0.02	Mauritius
0	0	0	0	0	0	0	0	0	0	**0**	0	Melilla
10	1	0	0.02	0	0	0	0.02	5	0	**0.02**	3	Morocco
1 933	185	900	3.2	0	0	0	3.2	800	0	**3.2**	610	Mozambique
99	10	0	0.04	0	0	0	0.04	10	0	**0.04**	32	Namibia
76	2	0	0.04	0	0	0	0.04	10	0	**0.04**	7	Niger
1 081	106	800	1.2	0	0	0	1.2	300	0	**1.2**	349	Nigeria
118	9	50	0.08	0	0	0	0.1	20	0	**0.1**	28	Réunion
791	118	10	0.8	0	0.02	0	0.8	205	0.03	**0.8**	388	Rwanda
2	0	0	0.004	0	0	0	0.004	1	0	**0.004**	0.59	São Tomé and Príncipe
54	14	45	0.03	0	0.003	0	0.03	8	0.04	**0.07**	46	Senegal
97	4	40	0.16	0	0.003	0	0.16	41	0.0004	**0.2**	14	Sierra Leone
196	19	10	0.2	0	0	0	0.2	50	0	**0.2**	63	Somalia
295	59	90	0.3	0	0.003	0	0.3	71	0.04	**0.3**	194	South Africa
29 910	1 980	0	4	0	0	0	4	1 000	0	**4**	6 523	Sudan
47	4	0	0.1	0	0	0	0.1	35	0	**0.1**	15	Swaziland
4 493	248	500	0.4	0	0	0	0.4	90	0	**0.4**	818	Tanzania
48	1	30	0.08	0	0	0	0.08	20	0	**0.08**	2	The Gambia
29	3	5	0.08	0	0	0	0.08	20	0	**0.08**	9	Togo
2	0	0	0.004	0	0	0	0.004	1	0	**0.004**	0.6	Tunisia
0	0	0	0	0	0	0	0	0	0	**0**	0	Western Sahara
13 640	1 321	1 400	20	0	0	0	20	5 000	0	**20**	4 352	Uganda
15 410	780	1 000	4.8	0	0	0	4.8	1 200	0	**4.8**	2 570	Zambia
332	16	50	1	0	0	0	1	250	0	**1**	53	Zimbabwe
130 126	**10 780**	**45 805**	**56**	**0**	**0.1**	**0**	**56**	**14 215**	**0.1**	**56.9**	**35 511**	**AFRICA TOTAL**

Country list of CO_2 emissions from degraded peatlands AMERICA

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
AMERICA	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Antigua and Barbuda	442	0	0	0	0	0	0	0	0	0	0	**0**
Anguilla	96	0	0	0	0	0	0	0	0	0	0	**0**
Argentina	2 780 400	2 400	240	0	0.03	0	0.01	0.01	0.05	18	0.002	**0.05**
Aruba	193	0	0	0	0	0	0	0	0	0	0	**0**
Bahamas	13 939	90	9	40	0.1	0	0	0	0.1	30	0	**0.12**
Barbados	430	0	0	0	0	0	0	0	0	0	0	**0**
Belize	22 965	250	50	240	0.04	0	0	0	0.04	10	0	**0.04**
Bermudas	53	1	0	1	0.004	0	0	0	0.004	1	0	**0.004**
Bolivia	1 098 581	100	10	10	0.04	0	0.02	0	0.05	15	0	**0.05**
Brazil	8 547 404	55 000	5 500	50 000	12	0	0.01	0	12	3 003	0.10	**12.1**
British Virgin Islands	153	0	0	0	0	0	0	0	0	0	0	**0**
Canada	9 970 610	1 134 000	155 000	159 000	3.5	0.2	0.2	0	3.7	1 820	1.1	**4.9**
Cayman Islands	262	3	0.3	2	0.004	0	0	0	0.004	1	0	**0.004**
Chile	756 626	11 000	1 125	0	0.09	0	0.03	0	0.12	40	0.01	**0.12**
Colombia	1 141 748	10 000	1 000	9 000	0.04	0	0.02	0	0.06	15	0.004	**0.06**
Costa Rica	51 060	350	35	300	0.04	0	0	0	0.04	10	0	**0.04**
Cuba	114 525	6 500	650	2 000	1.1	1.6	0	0.02	1.1	686	0	**2.7**
Dominica	750	1	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**
Dominican Republic	48 400	10	1	5	0.004	0	0	0	0.004	1	0	**0.004**
Ecuador	272 045	5 000	500	3 000	0.4	0	0	0	0.4	100	0	**0.4**
El Salvador	21 041	90	9	50	0.08	0	0	0	0.08	20	0	**0.08**
French Guiana	91 000	1 600	160	1 500	0.04	0	0	0	0.04	10	0	**0.04**
Greenland	2 175 600	10	1	0	0	0	0	0	0	0	0	**0**
Grenada	344	0	0	0	0	0	0	0	0	0	0	**0**
Guadeloupe (France)	1 780	10	1	7	0.004	0	0	0	0.004	1	0	**0.004**
Guatemala	108 889	200	20	180	0.04	0	0	0	0.04	10	0	**0.04**
Guyana	214 969	8 000	800	7 000	4	0	0	0	4	1 000	0	**4**
Haiti	27 750	1	0.1	0	0.004	0	0	0	0.004	1	0	**0.004**
Honduras	112 492	2 900	600	2 600	1.2	0	0	0	1.2	300	0	**1.2**
Jamaica	10 991	100	20	30	0.08	0	0	0	0.08	20	0	**0.08**

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km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**AMERICA**
0	0	0	0	0	0	0	0	0	0	**0**	0	Antigua and Barbuda
0	0	0	0	0	0	0	0	0	0	**0**	0	Anguilla
2 398	240	0	0.03	0	0.03	0.009	0.03	23	0.007	**0.07**	790	Argentina
0	0	0	0	0	0	0	0	0	0	**0**	0	Aruba
87	8	40	0.1	0	0	0	0.12	30	0	**0.1**	28	Bahamas
0	0	0	0	0	0	0	0	0	0	**0**	0	Barbados
249	50	240	0.04	0	0	0	0.04	10	0	**0.04**	164	Belize
0.91	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Bermudas
99	10	10	0.04	0	0.02	0	0.05	15	0	**0.05**	32	Bolivia
54 730	5 440	50 000	12	0	0.01	0	12	3 003	0.1	**12**	17 920	Brazil
0	0	0	0	0	0	0	0	0	0	**0**	0	British Virgin Islands
1 133 836	154 972	159 000	3.5	0.2	0.2	0	3.7	1 820	0.7	**4.6**	510 477	Canada
2.9	0.3	2	0	0	0	0	0	1	0.7	**0.7**	1	Cayman Islands
10 996	1 124	0	0.09	0	0.05	0	0.14	50	0.02	**0.2**	3 704	Chile
9 999	1 000	9 000	0.08	0	0.03	0	0.11	30	0.01	**0.1**	3 293	Colombia
349	35	300	0.04	0	0	0	0.04	10	0	**0.04**	115	Costa Rica
6 438	637	2 000	1.2	1.6	0	0.04	1.2	710	0	**2.8**	2 097	Cuba
0.9	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Dominica
9.9	1	5	0.01	0	0	0	0.01	2	0	**0.008**	3	Dominican Republic
4 991	498	3 000	0.4	0	0	0	0.4	100	0	**0.4**	1 641	Ecuador
88	9	50	0.08	0	0	0	0.08	20	0	**0.08**	28	El Salvador
1 599	160	1 500	0.04	0	0	0	0.04	10	0	**0.04**	526	French Guiana
10	1	0	0	0	0	0	0	0	0	**0**	3	Greenland
0	0	0	0	0	0	0	0	0	0	**0**	0	Grenada
9.91	1	7	0.004	0	0	0	0.004	1	0	**0.004**	3	Guadeloupe (France)
199	20	180	0.06	0	0	0	0.06	15	0	**0.06**	65	Guatemala
7 910	780	6 900	4	0	0	0	4	1 000	0	**4**	2 570	Guyana
0.9	0	0	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Haiti
2 873	594	2 500	1.5	0	0	0	1.5	375	0	**1.5**	1 957	Honduras
98.2	20	30	0.1	0	0	0	0.1	25	0	**0.1**	65	Jamaica

Country list of CO_2 emissions from degraded peatlands AMERICA

	1990											
Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
AMERICA (ctd)	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Martinique	1 102	1	0.100	1	0.004	0	0	0	0.004	1	0	**0.004**
Mexico	1 964 382	10 000	1 500	3 000	3.5	0	0	0	3.5	1 000	0	**3.5**
Montserrat	102	0	0	0	0	0	0	0	0	0	0	**0**
Netherlands Antilles	800	0	0	0	0	0	0	0	0	0	0	**0**
Nicaragua	129 494	3 700	370	2 000	0.4	0	0	0	0.4	100	0	**0.4**
Panama	75 517	3 300	330	3 000	0.4	0	0	0	0.4	100	0	**0.4**
Paraguay	406 752	100	10	50	0.08	0	0	0	0.08	20	0	**0.08**
Peru	1 280 000	50 000	1 000	40 000	0.4	0	0	0	0.4	100	0	**0.4**
Puerto Rico	9 104	100	10	50	0.08	0	0	0	0.08	20	0	**0.08**
St Kitts and Nevis	269	0	0	0	0	0	0	0	0	0	0	**0**
St Lucia	616	0	0	0	0	0	0	0	0	0	0	**0**
St Vincent and the Grenadines	389	0	0	0	0	0	0	0	0	0	0	**0**
Suriname	163 265	6 000	600	5 000	0.4	0	0	0	0.4	100	0	**0.4**
Trindade Island (Brazil)	14	1	0.1	0	0	0	0	0	0	0	0	**0**
Trinidad and Tobago	5 128	10	1	5	0.004	0	0	0	0.004	1	0	**0.004**
Turks and Caicos Islands	430	0	0	0	0	0	0	0	0	0	0	**0**
United States of America (Alaska)	1 518 800	132 000	15 500	70 000	0.1	0	0.01	0	0.1	109	0.11	**0.2**
United States of America (lower 48)	9 629 047	93 000	14 000	30 000	32.5	0	0.3	0	32.8	13 120	1.5	**67**
Uruguay	176 215	600	60	10	0.4	0	0.003	0	0.4	101	0	**0.4**
Venezuela	912 050	8 000	2 000	5 000	1.6	1.6	0.003	0	1.6	801	0.07	**3.3**
AMERICA TOTAL	**43 861 004**	**1 544 428**	**201 113**	**393 082**	**62.8**	**3**	**0.6**	**0**	**63**	**22 686**	**3**	**103**

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Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**AMERICA (ctd)**
0.9	0.08	0	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Martinique
9 910	1 483	3 000	3.5	0	0	0	3.5	1 000	0	**3.5**	4 884	Mexico
0	0	0	0	0	0	0	0	0	0	**0**	0	Montserrat
0	0	0	0	0	0	0	0	0	0	**0**	0	Netherlands Antilles
3 691	368	2 000	0.4	0	0	0	0.4	100	0	**0.4**	1 212	Nicaragua
3 291	328	3 000	0.4	0	0	0	0.4	100	0	**0.4**	1 081	Panama
98	10	50	0.08	0	0	0	0.08	20	0	**0.08**	32	Paraguay
49 991	998	40 000	0.4	0	0	0	0.4	100	0	**0.4**	3 288	Peru
98	10	50	0.08	0	0	0	0.08	20	0	**0.08**	32	Puerto Rico
0	0	0	0	0	0	0	0	0	0	**0**	0	St Kitts and Nevis
0	0	0	0	0	0	0	0	0	0	**0**	0	St Lucia
0	0	0	0	0	0	0	0	0	0	**0**	0	St Vincent and the Grenadines
5 991	598	5 000	0.4	0	0	0	0.4	100	0	**0.4**	1 970	Suriname
1	0.1	0	0	0	0	0	0	0	0	**0**	0.3	Trindade Island (Brazil)
9.9	1	5	0.01	0	0	0	0.01	2	0	**0.01**	3	Trinidad and Tobago
0	0	0	0	0	0	0		0	0	**0**	0	Turks and Caicos Islands
131 990	15 499	70 000	0.1	0	0.01	0	0.11	110	0.1	**0.2**	51 053	United States of America (Alaska)
91 819	13 668	30 000	32.5	0	0.3	0	32.8	13 130	1.4	**67**	45 024	United States of America (lower 48)
591	58	10	0.4	0	0	0	0.4	100	0	**0.4**	191	Uruguay
7 928	1 984	5 000	2	1.6	0.003	0	2.0	901	0.07	**3.7**	6 535	Venezuela
1 544 394	**200 603**	**392 881**	**64**	**3**	**0.6**	**0**	**64**	**22 937**	**3**	**104**	**660 787**	**AMERICA TOTAL**

Country list of CO_2 emissions from degraded peatlands ASIA

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
ASIA	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Afghanistan	652 225	120	6	0	0.08	0	0	0.08	0.2	40	0	**0.2**
Aldabra Islands	300	0	0	0	0	0	0	0		0	0	**0**
Armenia	29 800	55	6	0	0.06	0	0.03	0.03	0.1	40	0.04	**0.2**
Azerbaijan	86 600	32	3	0	0.06	0	0	0.02	0.08	25	0	**0.08**
Bahrain	707	0	0	0	0	0	0	0	0	0	0	**0**
Bangladesh	147 570	600	60	100	1.4	0	0.03	0.04	1.5	380	0.004	**1.5**
Bhutan	47 000	1	0.1	0	0	0	0	0	0	0	0	**0**
Brunei	5 765	1 000	100	900	0.2	0.2	0	0	0.2	100	0	**0.4**
Cambodia	181 035	0	0	0	0	0	0	0	0	0	0	**0**
Chagos Archipelago	60	0	0	0	0	0	0	0	0	0	0	**0**
China	9 571 300	34 770	3 477	500	42	0	0.03	0.3	42.3	14 120	9.2	**51**
Cocos Islands	14	0	0	0	0	0	0	0	0	0	0	**0**
East-Timor	14 609	0	0	0	0	0	0	0	0	0	0	**0**
Gaza strip	360	0	0	0	0	0	0	0	0	0	0	**0**
Georgia	69 700	450	45	230	0.2	0	0.06	0	0.2	75	0	**0.2**
India	3 165 596	1 000	100	500	2	0	0	0	2	500	0	**2**
Indonesia	1 904 443	270 000	55 000	220 000	200	0	0	0	200	50 000	0	**200**
Iran	1 648 000	300	30	10	0.2	0.003	0	0.03	0.2	61	0	**0.2**
Iraq	438 317	7 000	700	0	3	0	0	0	3	1 000	0	**3**
Israel	21 946	50	5	0	0.2	0	0	0	0.2	50	0	**0.2**
Jammu and Kashmir	222 236	120	12	0	0.2	0	0.03	0	0.2	70	0	**0.2**
Japan	377 837	2 500	250	10	5.2	0	0	0	5.2	2 064	0	**5.2**
Jordan	89 556	0	0	0	0	0	0	0	0	0	0	**0**
Kazakhstan	2 717 300	50	5	10	0.03	0	0	0	0.03	10	0	**0.03**
Kuwait	17 818	0	0	0	0	0	0	0	0	0	0	**0**
Kyrgyzstan	198 500	153	15	0	0.4	0	0.01	0	0.4	145	0.004	**0.4**
Laos	236 800	200	20	100	0.4	0	0	0	0.4	100	0	**0.4**
Lebanon	10 452	1	0.1	0	0.003	0	0	0	0.003	1	0	**0.003**
Malaysia	329 758	27 000	5 500	20 000	14	0	0.003	0	14	3 501	0.033	**14**

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Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**ASIA**
116	5.2	0	0.08	0	0	0.08	0.2	40	0	**0.2**	17	Afghanistan
0	0	0	0	0	0	0	0	0	0	**0**	0	Aldabra Islands
51.4	4.8	0	0.06	0	0.03	0.06	0.15	50	0.02	**0.2**	16	Armenia
29.8	2.8	0	0.06	0	0	0.015	0.08	25	0	**0.1**	9	Azerbaijan
0	0	0	0	0	0	0	0	0	0	**0**	0	Bahrain
566	53	100	1.4	0	0.03	0.04	1.5	380	0	**1.5**	173	Bangladesh
1	0.1	0	0	0	0	0	0	0	0	**0**	0.3	Bhutan
991	98.0	850	0.4	0.3	0	0	0.4	140	0	**0.6**	323	Brunei
0	0	0	0	0	0	0	0	0	0	**0**	0	Cambodia
0	0	0	0	0	0	0	0	0	0	**0**	0	Chagos Archipelago
33 499	3 224	500	67.5	0	0.03	0.3	67.8	27 120	9.2	**77**	10 619	China
0	0	0	0	0	0	0	0	0	0	**0**	0	Cocos Islands
0	0	0	0	0	0	0	0	0	0	**0**	0	East-Timor
0	0	0	0	0	0	0	0	0	0	**0**	0	Gaza strip
443	44	230	0.2	0	0.04	0	0.2	65	0	**0.2**	145	Georgia
955	90	500	2	0	0	0	2	500	0	**2**	297	India
265 500	54 016	140 000	500	0	0	0	500	125 000	0	**500**	177 930	Indonesia
295	29.1	10	0.2	0	0	0.03	0.2	60	0	**0.2**	96	Iran
2 000	200	0	0.3	0	0	3	3.3	1 100	0	**3.3**	659	Iraq
45.5	4.3	0	0.1	0	0	0	0.1	40	0	**0.1**	14	Israel
114	11.0	0	0.2	0	0.03	0	0.2	70	0	**0.2**	36	Jammu and Kashmir
2 314	225	10	4.6	0	0	0	4.6	1 842	0	**4.6**	740	Japan
0	0	0	0	0	0	0	0	0	0	**0**	0	Jordan
49.1	4.9	10	0.03	0	0	0	0.03	10	0	**0.03**	16	Kazakhstan
0	0	0	0	0	0	0	0	0	0	**0**	0	Kuwait
140	13.2	0	0.38	0	0.03	0	0.4	135	0.004	**0.4**	43	Kyrgyzstan
191	18	90	0.4	0	0	0	0.4	100	0	**0.4**	59	Laos
0.9	0.09	0	0.003	0	0	0	0.003	1	0	**0.003**	0.3	Lebanon
26 685	5 431	14 000	48	0	0	0	48	12 000	0	**48**	17 890	Malaysia

Country list of CO_2 emissions from degraded peatlands ASIA

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
ASIA (ctd)	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Maldives	298	1	0.1	0	0.004	0	0	0	0.004	1	0	**0.004**
Mongolia	1 566 500	27 200	900	10	30	0	0	0.3	30.3	10 100	0	**30.3**
Myanmar	676 552	2 000	150	1 000	4	0	0	0	4	1 000	0	**4.0**
Nepal	147 181	10	0.5	0	0.02	0	0	0	0.02	5	0	**0.02**
North Korea	120 538	1 300	130	50	1.8	0.75	0.02	0	1.8	1 010	0.04	**2.6**
Oman	309 500	0	0	0	0	0	0	0	0	0	0	**0**
Pakistan	796 095	150	15	0	0.04	0	0.003	0	0.04	11	0.004	**0.05**
Philippines	300 000	110	11	30	0.3	0	0	0	0.3	80	0	**0.3**
Qatar	11 427	0	0	0	0	0	0	0	0	0	0	**0**
Russia Asian part	13 598 200	1 177 000	117 700	20 000	12.5	2.5	1.5	2.5	16.5	8 000	0	**19**
Saudi Arabia	2 240 000	0	0	0	0	0	0	0	0	0	0	**0**
Seychelles	454	0	0	0	0	0	0	0	0	0	0	**0**
Singapore	648	150	3	1	0.004	0	0	0.07	0.07	141	0	**0.07**
South Korea	99 268	5	0.5	0	0.01	0	0	0	0.01	4	0	**0.01**
Sri Lanka	65 610	25	1	0	0.09	0	0	0	0.09	23	0	**0.09**
Syria	185 180	3	0.3	0	0.01	0	0	0	0.01	3	0	**0.01**
Taiwan	36 000	0	0	0	0	0	0	0	0	0	0	**0**
Tajikistan	143 100	1	0.1	0	0	0	0	0	0	0	0	**0**
Thailand	513 115	680	68	650	1.2	1	0	0	1.2	550	0	**2.2**
Turkey	779 452	130	13	0	0.3	0	0.03	0.03	0.3	110	0.04	**0.4**
Turkmenistan	488 100	100	5	0	0.3	0	0	0	0.3	100	0	**0.3**
United Arab Emirates	83 600	1	0	0	0.003	0	0	0	0.003	1	0	**0.003**
Uzbekistan	447 400	400	20	10	1.1	0	0	0.03	1.1	360	0	**1.1**
Vietnam	331 690	2 500	250	1 200	5.2	0	0.03	0	5.2	1 310	0.04	**5.3**
Yemen	527 970	1	0.1	0	0.003	0	0	0	0.003	1	0	**0.003**
ASIA TOTAL	**45 655 472**	**1 557 169**	**184 602**	**265 311**	**326.3**	**4**	**1.8**	**3**	**331**	**95 092**	**9**	**345**

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Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**ASIA (ctd)**
0.9	0.1	0	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Maldives
26 291	751	10	45	0	0	0.3	45.3	15 100	0	**45.3**	2 474	Mongolia
1 910	130	900	4	0	0	0	4	1 000	0	**4**	429	Myanmar
9.6	0.4	0	0.02	0	0	0	0.02	5	0	**0.02**	1.40	Nepal
1 209	117	50	1.8	0.8	0.02	0	1.8	1 010	0.04	**2.6**	387	North Korea
0	0	0	0	0	0	0	0	0	0	**0**	0	Oman
149	15	0	0.04	0	0.003	0	0.04	11	0.004	**0.05**	49	Pakistan
103	9	20	0.3	0	0	0	0.3	80	0	**0.3**	31	Philippines
0	0	0	0	0	0	0	0	0	0	**0**	0	Qatar
1 176 280	117 607	20 000	12.5	2.5	1.5	5	19	9 000	0	**21.5**	387 396	Russia Asian part
0	0	0	0	0	0	0	0	0	0	**0**	0	Saudi Arabia
0	0	0	0	0	0	0	0	0	0	**0**	0	Seychelles
137	3	1	0.004	0	0	0.07	0.07	136	0	**0.07**	9	Singapore
4.6	0.4	0	0.01	0	0	0	0.01	4	0	**0.01**	1.5	South Korea
22.9	0.5	0	0.08	0	0	0	0.08	21	0	**0.08**	1.8	Sri Lanka
2.7	0.3	0	0.01	0	0	0	0.01	3	0	**0.01**	0.84	Syria
0	0	0	0	0	0	0	0	0	0	**0**	0	Taiwan
1	0.1	0	0	0	0	0	0	0	0	**0**	0.33	Tajikistan
631	57	280	1.4	0.76	0	0	1.4	540	0	**2.2**	188	Thailand
120	11	0	0.3	0	0.03	0.03	0.3	105	0.04	**0.3**	37	Turkey
91	4	0	0.3	0	0	0	0.3	90	0	**0.3**	12	Turkmenistan
0.9	0.1	0	0.003	0	0	0	0.003	1	0	**0.003**	0.3	United Arab Emirates
368	15	10	1.1	0	0	0.02	1.1	355	0	**1.1**	48	Uzbekistan
2 382	224	800	5.2	0	0.03	0	5.2	1 310	0	**5.2**	738	Vietnam
0.9	0.1	0	0.003	0	0	0	0.003	1	0	**0.003**	0.3	Yemen
1 545 709	**182 419**	**52 371**	**698**	**4**	**1.7**	**9**	**708**	**197 451**	**9**	**722**	**600 888**	**ASIA TOTAL**

Country list of CO_2 emissions from degraded peatlands
AUSTRALASIA and the PACIFIC ISLES

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
AUSTRALASIA & PACIFIC ISLES	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
American Samoa (USA)	195	0	0	0	0	0	0	0	0	0	0	**0**
Australia (excl. Tasmania)	7 614 500	1 000	100	50	3.6	0	0.03	0	3.6	910	0.04	**3.7**
Clipperton	6	0	0	0	0	0	0	0	0	0	0	**0**
Cook Islands	237	4	0.4	1	0.01	0	0	0	0.01	3	0	**0.01**
Easter Island (Chile)	117	1	0.1	0	0	0	0	0	0	0	0	**0**
Fiji	18 376	40	4	20	0.08	0	0	0	0.08	20	0	**0.08**
French Polynesia	3 521	1	0.1	0	0.004	0	0	0	0.004	1	0	**0.004**
Galápagos Islands (Ecuador)	7 844	1	0.1	0	0	0	0	0	0	0	0	**0**
Guam (U.S.A.)	541	1	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**
Hawaii (U.S.A.)	16 179	37	4	5	0.02	0	0	0	0.02	5	0	**0.02**
Islas Desventuradas (Chile)	10	0	0	0	0	0	0	0	0	0	0	**0**
Juan Fernández Islands (Chile)	183	1	0.1	0	0	0	0	0	0	0	0	**0**
Kiribati	811	2	0.2	0	0.004	0	0	0	0.004	1	0	**0.004**
Marshall Islands	181	0	0	0	0	0	0	0	0	0	0	**0**
Micronesia (Federated States of)	702	35	4	30	0.02	0	0	0	0.02	5	0	**0.02**
Nauru	21	0	0	0	0	0	0	0	0	0	0	**0**
New Caledonia and Dep. (France)	19 058	1	0.1	1	0	0	0	0	0	0	0	**0**
New Zealand	270 534	2 100	210	50	4.5	0	0.13	0	4.6	1 550	7.0	**11.6**
Palau	488	1	0.1	1	0	0	0	0	0	0	0	**0**
Papua New Guinea	462 840	60 000	6 000	45 000	3.5	0	0	0	3.5	870	0	**3.5**
Pitcairn Islands	47	0	0	0	0	0	0	0	0	0	0	**0**
Sala y Gómez	3	0	0	0	0	0	0	0	0	0	0	**0**
Samoa	2 831	2	0.2	1	0.004	0	0	0	0.004	1	0	**0.004**
Solomon Islands	27 556	10	1	5	0.01	0	0	0	0.01	3	0	**0.01**
Tasmania	68 331	10 000	500	0	3	0	0.003	0	3	1 000	0.004	**3**
Tokelau	10	0	0	0	0	0	0	0	0	0	0	**0**
Tonga	750	1	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**
Tuvalu	26	0	0	0	0	0	0	0	0	0	0	**0**
Vanuatu	12 190	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL AUSTRALASIA & PACIFIC ISLES	**8 528 088**	**73 238**	**6 824**	**45 166**	**14.7**	**0**	**0.2**	**0**	**15**	**4 372**	**7**	**21.9**

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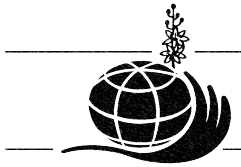
2008

Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**AUSTRALASIA & PACIFIC ISLES**
0	0	0	0	0	0	0	0	0	0	**0**	0	American Samoa (USA)
918	82	50	3.4	0	0.03	0	3.4	860	0.04	**3.5**	270	Australia (excl. Tasmania)
0	0	0	0	0	0	0	0	0	0	**0**	0	Clipperton
4	0.3	1	0.01	0	0	0	0.01	3	0	**0.01**	1.1	Cook Islands
1	0.1	0	0	0	0	0	0	0	0	**0**	0.3	Easter Island (Chile)
38	4	20	0.08	0	0	0	0.08	20	0	**0.08**	12	Fiji
1	0.1	0	0.004	0	0	0	0.004	1	0	**0**	0.3	French Polynesia
1	0.1	0	0	0	0	0	0	0	0	**0**	0.3	Galápagos Islands (Ecuador)
1	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Guam (U.S.A.)
37	4	5	0.02	0	0	0	0.02	5	0	**0.02**	12	Hawaii (U.S.A.)
0	0	0	0	0	0	0	0	0	0	**0**	0	Islas Desventuradas (Chile)
1	0.1	0	0	0	0	0	0	0	0	**0**	0.3	Juan Fernández Islands (Chile)
2	0.2	0	0.004	0	0	0	0.004	1	0	**0.004**	0.6	Kiribati
0	0	0	0	0	0	0	0	0	0	**0**	0	Marshall Islands
35	3	30	0.02	0	0	0	0.02	5	0	**0.02**	11	Micronesia (Federated States of)
0	0	0	0	0	0	0	0	0	0	**0**	0	Nauru
1	0.1	1	0	0	0	0	0	0	0	**0**	0.3	New Caledonia and Dep. (France)
1 961	170	50	3.9	0	0.13	0	4.0	1 350	0.10	**4.1**	559	New Zealand
1	0.1	1		0	0	0	0	0	0	**0**	0.3	Palau
59 922	5 983	40 000	20	0	0	0	0.004	5 000	0	**20**	19 708	Papua New Guinea
0	0	0	0	0	0	0	0.01	0	0	**0**	0	Pitcairn Islands
0	0	0	0	0	0	0	3	0	0	**0**	0	Sala y Gómez
2	0.2	1	0.004	0	0	0	0.004	1	0	**0.004**	0.6	Samoa
10	1	5	0.01	0	0	0	0.01	3	0	**0.01**	3	Solomon Islands
9 909	485	0	3	0	0.03	0	3.0	1 010	0.004	**3.0**	1 598	Tasmania
0	0	0	0	0	0	0	0	0	0	**0**	0	Tokelau
1	0.1	1	0.004	0	0	0	0.004	1	0	**0.004**	0.3	Tonga
0	0	0	0	0	0	0	0	0	0	**0**	0	Tuvalu
0	0	0	0	0	0	0	0	0	0	**0**	0	Vanuatu
72 845	**6 733**	**40 166**	**30**	**0**	**0.2**	**0**	**14**	**8 261**	**0**	**30.8**	**22 178**	**TOTAL AUSTRALASIA & PACIFIC ISLES**

Country list of CO_2 emissions from degraded peatlands EUROPE

	1990											
Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
EUROPE	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	**Mton CO_2/a**
Albania	28 748	179	18	0	0.6	0	0	0	0.6	175		**0.6**
Andorra	468	5	0.5	0	0.003	0	0	0	0.003	1		**0.003**
Austria	83 858	200	20	10	0.3	0.02	0.02	0	0.3	120		**0.3**
Azores	2 335	3	0.3	0	0	0	0	0	0	0		**0**
Belarus	207 595	23 976	1 320	6 000	27.1	7.7	0.6	6	33.7	18 050		**41.3**
Belgium	30 528	160	16	11	0.3	0.02	0.08	0	0.3	160		**0.3**
Bosnia & Herz.	51 129	150	15	0	0.4	0	0	0	0.4	140		**0.4**
Bulgaria	110 994	120	7	1	0.2	0	0.008	0.01	0.2	90		**0.2**
Channel Islands	205	10	1	0	0.03	0	0	0	0.03	10		**0.03**
Croatia	56 510	2	0.2	0	0.003	0	0	0	0.003	1		**0.003**
Czech Republic	78 864	270	27	90	0.3	0.2	0.05	0	0.3	220		**0.5**
Cyprus	9 251	1	0.1	0	0	0	0	0	0	0		**0**
Denmark	43 094	1 400	98	750	1.5	1.45	0.08	0	1.6	1 375		**3.03**
Estonia	45 227	10 000	1 000	2 000	7.5	6	0.50	0	8.0	6 330		**14.0**
Faroe Islands	1 400	30	3	0	0.008	0	0.003	0	0.01	6		**0.01**
Finland	338 145	85 000	5 320	60 000	11.9	39.6	0.7	0	12.5	61 900		**52.1**
France	543 965	1500	150	50	2.5	0.2	0.02	0	2.5	1 115		**2.7**
FYRO Macedonia	25 713	30	3	15	0.06	0	0	0	0.06	25		**0.06**
Germany	356 970	18 000	2 200	2 600	32.5	2	1.2	0	33.7	14 800		**35.7**
Gibraltar	6	0	0	0	0	0	0	0	0	0		**0**
Greece	131 957	71	7	1	0.14	0	0.003	0.003	0.1	57		**0.1**
Hungary	93 030	330	33	0	0.8	0	0.03	0	0.8	320		**0.8**
Iceland	103 000	14 000	650	40	17.5	0.03	0	0.01	17.5	7 050		**17.5**
Ireland	70 273	11 500	1 250	260	8.9	0.5	1.1	0	10.0	4 558		**10.5**
Isle of Man	572	0	0	0	0	0	0	0	0	0		**0**
Italy	301 323	200	20	10	0.4	0	0	0	0.4	100		**0.4**
Jan Mayen	373	0	0	0	0	0	0	0	0	0		**0**
Latvia	63 700	6 600	660	700	3.1	1.4	0.6	0	3.7	2 330		**5.1**
Liechtenstein	160	1	0.1	0	0.003	0	0	0	0.003	1		**0.003**
Lithuania	65 300	3 520	352	1 250	3.1	2.5	0.3	0	3.4	2 680		**5.90**



INTERNATIONAL MIRE CONSERVATION GROUP

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WETLANDS INTERNATIONAL

2008

Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	**Mton CO_2/a**	Mton CO_2	**EUROPE**
163	14.9	0	0.6	0	0	0	0.6	160		**0.6**	49	Albania
4.9	0.5	0	0.003	0	0	0	0.003	1		**0.003**	1.6	Andorra
189	18.6	10	0.25	0.02	0.02	0	0.3	120		**0.3**	61	Austria
3	0.3	0	0	0	0	0	0	0		**0**	1.0	Azores
22 352	1 305	7 000	27.1	7.7	0.6	6	33.7	18 050		**41.3**	4 299	Belarus
146	14.3	9	0.2	0.02	0.08	0	0.3	160		**0.3**	47	Belgium
137	13.3	0	0.32	0	0	0	0.3	127		**0.3**	44	Bosnia & Herz.
112	5.9	0	0.16	0	0	0.01	0.2	70		**0.2**	20	Bulgaria
9.1	0.9	0	0.02	0	0	0	0.02	9		**0.02**	2.9	Channel Islands
1.9	0.2	0	0.0	0	0	0	0.002	0.9		**0.002**	0.6	Croatia
250	24.3	90	0.3	0.2	0.05	0	0.3	220		**0.5**	80	Czech Republic
1	0.1	0	0	0	0	0	0	0		**0**	0.3	Cyprus
1 276	73.6	750	1.5	1.5	0.08	0	1.6	1 375		**3.0**	243	Denmark
9 430	919	2 000	7.5	1.6	0.5	0	8.0	4 900		**9.6**	3 029	Estonia
29.5	2.9	0	0.01	0	0.003	0	0.01	6		**0.01**	10	Faroe Islands
79 429	5 294	60 000	7.5	41.6	0.9	0	8.4	63 250		**49.9**	17 438	Finland
1 400	137	50	2.5	0.2	0.03	0	2.5	1 120		**2.7**	450	France
27.8	2.7	15	0.05	0	0	0	0.05	20		**0.05**	9	FYRO Macedonia
16 668	2 018	2 600	30	2	0	0	30	13 000		**32**	6 646	Germany
0	0	0	0	0	0	0	0	0		**0**	0	Gibraltar
66	6.4	1	0.1	0	0.003	0	0.1	54		**0.1**	21	Greece
301	28.8	0	0.7	0	0.03	0	0.7	290		**0.7**	95	Hungary
13 366	564	40	17.5	0.03	0	0	17.5	7 040		**17.5**	1 857	Iceland
11 090	1 130	200	6.4	0.2	1.7	0	8	3 740		**8.2**	3 722	Ireland
0	0	0	0	0	0	0	0	0		**0**	0	Isle of Man
191	18.3	10	0.35	0	0	0	0.4	100		**0.4**	60	Italy
0	0	0	0	0	0	0	0	0		**0**	0	Jan Mayen
6 390	635	700	2.3	1.4	0.6	0	2.8	1 980		**4.2**	2 092	Latvia
0.9	0.1	0	0.003	0	0	0	0.003	1		**0.003**	0.3	Liechtenstein
3 279	323	1 300	3.3	2.6	0.2	0	3.5	2 740		**6.1**	1 064	Lithuania

Country list of CO_2 emissions from degraded peatlands EUROPE

	1990											
Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
EUROPE (ctd)	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	**Mton CO_2/a**
Luxembourg	2 586	3	0.3	1	0.005	0.002	0	0	0.005	3		**0.007**
Malta	316	0	0	0	0	0	0	0	0	0		**0**
Moldova	33 700	10	1	0	0.02	0	0	0	0.02	9		**0.02**
Monaco	2	0	0	0	0	0	0	0	0	0		**0**
Netherlands	41 526	3 770	377	117	8.6	0	0.2	0	8.8	3 550		**8.8**
Norway	385 639	30 000	2 250	2 400	2.1	1.6	0.3	0	2.4	3 495		**4.1**
Poland	312 684	12 500	1 000	21 000	20	4	1.2	0	21.2	10 800		**25.2**
Portugal	92 345	20	2	1	0.05	0	0.003	0	0.06	16		**0.06**
Romania	237 500	1 000	100	10	1	0	0.03	0	1.0	420		**1.0**
Russia European part	3 477 000	213 000	21 300	50 000	85	58	132	0	217	151 000		**275**
San Marino	61	0	0	0	0	0	0	0	0	0		**0**
Serbia and Montenegro	77 474	300	30	0	0.5	0	0	0	0.5	200		**0.5**
Slovakia	49 035	130	13	30	0.2	0.10	0.02	0	0.2	129		**0.3**
Slovenia	20 253	80	8	1	0.2	0	0	0	0.2	70		**0.2**
Spain	505 990	60	6	1	0.1	0	0.003	0.02	0.1	36		**0.1**
Svalbard /Spitsbergen	62 160	10	1	0	0	0	0	0	0	0		**0**
Sweden	449 964	66 800	6 680	30 000	7.5	7	0.08	0	7.6	13 080		**14.6**
Switzerland	41 285	300	30	10	0.3	0.02	0.03	0	0.3	130		**0.3**
Ukraine	603 700	8 000	800	2 000	3.8	4	0.5	0	4.2	3 820		**8.2**
United Kingdom	244 110	17 500	1 800	2 200	5.1	4.4	0.08	0	5.2	4 304		**9.6**
Vatican City	44	0	0	0	0	0	0	0	0	0		**0**
EUROPE TOTAL	**9 484 057**	**530 741**	**47 570**	**181 559**	**253.4**	**140.6**	**139**	**6**	**399**	**312 676**		**539.5**

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Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	**Mton CO_2/a**	Mton CO_2	**EUROPE (ctd)**
2.7	0.3	1	0.003	0.002	0	0	0.003	2		**0.005**	0.875	Luxembourg
0	0	0	0	0	0	0	0	0		**0**	0	Malta
9.2	0.9	0	0.02	0	0	0	0.02	8		**0.02**	3	Moldova
0	0	0	0	0	0	0	0	0		**0**	0	Monaco
3 451	334	130	5.8	0	0	0	5.8	2 300		**5.8**	1 100	Netherlands
29 685	2 230	2 700	2.3	2.9	0.3	0	2.6	5 300		**5.4**	7 344	Norway
11 528	876	2 500	17.5	4.8	1.2	0	18.7	10 200		**23.5**	2 884	Poland
18.6	1.7	1	0.05	0	0.003	0	0.05	15		**0.05**	6	Portugal
962	95	10	1	0	0.03	0	1.0	420		**1.0**	313	Romania
199 410	19 948	50 000	87.5	40	11.4	0	98.9	62 600		**139**	65 707	Russia European part
0	0	0	0	0	0	0	0	0		**0**	0	San Marino
282	27.5	0	0.6	0	0	0	0.6	230		**0.6**	91	Serbia and Montenegro
118	11.6	60	0.2	0.08	0.02	0	0.2	110		**0.2**	38	Slovakia
74	7.1	1	0.2	0	0	0	0.2	67		**0.2**	24	Slovenia
57	5.4	1	0.1	0	0.005	0.02	0.1	37		**0.1**	18	Spain
10	1	0	0	0	0	0	0	0		**0**	3	Svalbard /Spitsbergen
65 623	5 000	30 000	7.5	7	0.08	0	7.6	13 080		**14.6**	16 470	Sweden
288	29	15	0.3	0.02	0.03	0	0.3	130		**0.3**	94	Switzerland
7 656	760	2 000	1.8	3	0.15	0	1.9	2 300		**4.9**	2 502	Ukraine
17 113	1 745	2 200	5.1	4.4	0.08	0	5.2	4 304		**9.6**	5 747	United Kingdom
0	0	0	0	0	0	0	0	0		**0**	0	Vatican City
504 608	**43 620**	**164 394**	**238**	**121**	**18**	**6**	**262**	**219 637**		**383.2**	**143 684**	**EUROPE TOTAL**

Country list of CO_2 emissions from degraded peatlands
ANTARCTICA and the SUBANTARCTIC ISLES

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
ANTARCTICA and the SUBANTARCTIC ISLES	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**
Adams Island	100	0	0	0	0	0	0	0	0	0	0	**0**
Adelaide Island	3 265	0	0	0	0	0	0	0	0	0	0	**0**
Amsterdam and St-Paul Islands	62	30	3	0	0	0	0	0	0	0	0	**0**
Antarctica	14 000 000	3 000	200	0	0	0	0	0	0	0	0	**0**
Antipodes Islands	22	18	1.8	0	0	0	0	0	0	0	0	**0**
Anvers Island	2 432	10	0.5	0	0	0	0	0	0	0	0	**0**
Auckland Islands	570	400	40	0	0	0	0	0.001	0.001	1	0	**0.001**
Balleny Islands	400	0	0	0	0	0	0	0	0	0	0	**0**
Bouvetøya		0	0	0	0	0	0	0	0	0	0	**0**
Campbell Island group	113	80	8	0	0	0	0	0.005	0.005	5	0	**0.005**
Chatham Islands	963	450	90	0	0	0	0	0	0	0	0	**0**
Falkland Islands / Islas Malvinas	12 173	11 500	1 150	0	0.005	0	0.02	1	1.0	1 025	0.04	**1.1**
Heard Island and McDonald Islands	370	10	1	0	0	0	0	0	0	0	0	**0**
Îles Crozet	325	30	3	0	0	0	0	0	0	0	0	**0**
Kerguelen Islands	6 993	20	2	0	0	0	0	0.001	0.001	1	0	**0.001**
Macquarie Island	128	60	6	0	0	0	0	0	0	0	0	**0**
Prince Edward Islands	360	15	1.5	0	0	0	0	0	0	0	0	**0**
The Snares	4	0	0	0	0	0	0	0	0	0	0	**0**
South Georgia	3 755	200	20	0	0	0	0	0	0	0	0	**0**
South Orkney Islands	620	10	0.5	0	0	0	0	0	0	0	0	**0**
South Sandwhich Islands	580	1	0	0	0	0	0	0	0	0	0	**0**
South Shetland Islands	4 660	0.2	0	0	0	0	0	0	0	0	0	**0**
St. Helena	122	65	6.5	0	0	0	0	0	0	0	0	**0**
Tristan da Cunha	202	65	6.5	0	0	0	0	0	0	0	0	**0**
ANTARCTICA and the SUBANTARCTIC ISLES TOTAL	**14 038 119**	**15 9642**	**1 540**	**0**	**0**	**0**	**0**	**1**	**1**	**1 032**	**0.04**	**1.1**

No peatland data is available for following islands and territories: Bearing Island, Booth Island, Bounty Islands, Bowman Island, Brabant Island, Breaker Island, Christine Island, Cormorant Island, Cuverville Island, Danco Island, DeLaca Island, Direction Island, Dream Island, Drygalski Island, Dundee Island, Eichorst Island, Elephant Rocks, Enterprise Island, Henderson Island, Hermit Island, Humble Island, Janus Island, Joinville Island group, Laggard Island, Liège Island, Limitrophe Island, Lipps Island, Litchfield Island, Masson Island, Mill Island, Nansen Island, North Nansen Island, Ohlin Island, Outcast Islands, Paulet Island, Robertson Island, Rongé Island, Split Rock, Spume Island, Stepping Stones, Stonington Island, Surge Rocks, Torgersen Island, Tower Island, Trinity Island, Wiencke Island, Windmill Islands.

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UNIVERSITÄT GREIFSWALD

Wissen
lockt.
Seit 1456

WETLANDS
INTERNATIONAL

2008

Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	Mton CO_2/a	**Mton CO_2/a**	Mton CO_2	**ANTARCTICA and the SUBANTARCTIC ISLES**
0	0	0	0	0	0	0	0	0	0	**0**	0	Adams Island
0	0	0	0	0	0	0	0	0	0	**0**	0	Adelaide Island
30	3	0	0	0	0	0	0	0	0	**0**	10	Amsterdam and St-Paul Islands
3 000	200	0	0	0	0	0	0	0	0	**0**	659	Antarctica
18	1.8	0	0	0	0	0	0	0	0	**0**	6	Antipodes Islands
10	0.5	0	0	0	0	0	0	0	0	**0**	2	Anvers Island
400	40	0	0	0	0	0.001	0.001	1	0	**0.001**	132	Auckland Islands
0	0	0	0	0	0	0	0	0	0	**0**	0	Balleny Islands
0	0	0	0	0	0	0	0	0	0	**0**	0	Bouvetøya
80	8	0	0	0	0	0.005	0.005	5	0	**0.005**	26	Campbell Island group
450	90	0	0	0	0	0	0	0	0	**0**	296	Chatham Islands
11 408	1 145	0	0.005	0	0.02	1	1.0	1 025	0	**1.0**	3 771	Falkland Islands / Islas Malvinas
10	1	0	0	0	0	0	0	0	0	**0**	3	Heard Island and McDonald Islands
30	3	0	0	0	0	0	0	0	0	**0**	10	Îles Crozet
20	2	0	0	0	0	0.001	0.001	1	0	**0.001**	7	Kerguelen Islands
60	6	0	0	0	0	0	0	0	0	**0**	20	Macquarie Island
15	1.5	0	0	0	0	0	0	0	0	**0**	5	Prince Edward Islands
0	0	0	0	0	0	0	0	0	0	**0**	0	The Snares
200	20	0	0	0	0	0	0	0	0	**0**	66	South Georgia
10	0.5	0	0	0	0	0	0	0	0	**0**	2	South Orkney Islands
1	0	0	0	0	0	0	0	0	0	**0**	0	South Sandwhich Islands
0	0	0	0	0	0	0	0	0	0	**0**	0	South Shetland Islands
65	6.5	0	0	0	0	0	0	0	0	**0**	21	St. Helena
65	6.5	0	0	0	0	0	0	0	0	**0**	21.41	Tristan da Cunha
15 871	**1 535**	**0**	**0**	**0**	**0**	**1**	**1**	**1 032**	**0**	**1.0**	**5 057**	**ANTARCTICA and the SUBANTARCTIC ISLES TOTAL**

CO_2 emissions from degraded peatlands THE WORLD

1990

Country/area	Area of country /area	Peatland area 1990	Peat carbon stock 1990	Forested peatland area 1990	Emissions from 1990 peatland drained for agriculture before 1990	Emissions in 1990 from 1990 peatland drained for forestry before 1990	Emissions in 1990 from 1990 peatland drained for peat extraction before 1990	Emissions in 1990 from 1990 peatland drained for other purposes before 1990	Emissions in 1990 from peat from non-forested peatland	Total degrading peatland area in 1990	Emissions from peat extracted in 1990	**Total emissions in 1990 from degrading peat**
WORLD	km^2	km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	**Mton CO_2/a**
TOTAL	**151 898 914**	**3 850 773**	**452 661**	**931 464**	**704**	**148**	**142**	**10.5**	**857**	**447 637**		**1 058**

INTERNATIONAL MIRE CONSERVATION GROUP

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WETLANDS INTERNATIONAL

2008

Peatland area 2008	Peat carbon stock 2008	Forested peatland area 2008	Emissions in 2008 from 2008 peatland drained for agriculture before 2008	Emissions in 2008 from 2008 peatland drained for forestry before 2008	Emissions in 2008 from 2008 peatland drained for peat extraction before 2008	Emissions in 2008 from 2008 peatland drained for other purposes before 2008	Emissions from peat from non-forested peatland 2008	Total degrading peatland area 2008	Emissions from peat extracted in 2008	**Total emissions from degrading peat 2008**	Total technically possible future emissions	**Country/area**
km^2	Mton C	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	**Mton CO_2/a**	Mton CO_2	**WORLD**
3 813 553	**445 691**	**695 617**	**1 086**	**129**	**21**	**16**	**1 106**	**426 381**		**1 298**	**1 468 105**	**TOTAL**

Mission:

To sustain and restore wetlands, their resources and biodiversity for future generations.

HEADQUARTERS
PO Box 471
6700 AL Wageningen
The Netherlands
Tel.: + 31 318-660910
Fax: + 31 318-660950
E-mail: post@wetlands.org
Website: http://www.wetlands.org

AFRICA

Senegal
Rue 111, Zone B, Villa N° 39B
BP 25 581 Dakar - Fann, Senegal
Tel.: +221 33 869 1681
Fax: +221 33 825 1292
E-mail: wetlands@orange.sn
Website: http://afrique.wetlands.org

Mali
PO Box 97
Mopti/Sévaré, Mali
Tel.: +223 21 420 122, Fax: +223 21 420 242
E-mail: malipin@afribone.net.ml
Website: http://afrique.wetlands.org

Guinea-Bissau
c/o Gabinete de Planificação Costeira (GPC)
(Coastal Planning Office)
CP 23, 1031 Bissau-Codex
Guinea-Bissau
Tel.: +245 20 12 30 / Mobile: +245 72 00 562
Fax: +245 20 11 68
E-mail: gpc@sol.gtelecom.gw /
joaosa2003@hotmail.com
Website: http://afrique.wetlands.org

Kenya
ICIPE Campus, Kasarani Road
P.O. Box 3502-00100 Nairobi, Kenya
Tel.: +254 20 8562246
Fax: +254 20 8562259
E-mail: Oliver.Nasirwa@Birdlife.or.ke
Website: http://afrique.wetlands.org

AMERICAS

Argentina
25 de Mayo 758 10 I (1002)
Buenos Aires, Argentina
Tel./Fax: +54 11 4312 0932
E-mail: deblanco@wamani.apc.org
Website: http://lac.wetlands.org

Panama
Ramsar CREHO
City of Knowledge / Ciudad del Saber
House 131 A
Apdo. Postal 0816 - 03847 Zona 3
Panamá, Rep. de Panamá
Tel.: +507 317 1242
Fax: +507 317 0876
E-mail: julio.montesdeocalugo@wetlands.org
Website: http://lac.wetlands.org

NORTH ASIA
Room 501, Grand Forest Hotel, No. 3A
Beisanhuan, Zhonglu Road
Beijing 100029, People's Republic of China
Tel.: +86 10 62058405/18 or 62377031
Fax: +86 10 620 77900
E-mail: ckl@wetwonder.org,
zxh@wetwonder.org
Website: http://www.wetwonder.org

Japan
6F NCC Ningyocho Building, 3-7-3 Ningyo-cho,
Nihonbashi, Chuo-ku, Tokyo 103-0013, Japan
Tel: +81 3 5332 3362, Fax: +81 3 5332 3364
E-mail: info@wi-japan.org
Website: http://japan.wetlands.org

OCEANIA

Canberra - Australia
PO Box 4573
Kingston ACT 2604
Australia
Tel.: +61 2 6260 8341, Fax: +61 2 6232 7727
E-mail : doug.watkins@wetlands-oceania.org
Website: http://oceania.wetlands.org

Brisbane - Australia
c/o Queensland Herbarium
Brisbane Botanic Gardens, Mt Coot-tha Road
Toowong, QLD 4066, Australia
Tel.: +61 7 3406 6047, Fax: +61 7 3896 9624
E-mail: roger.jaensch@wetlands-oceania.org
Website: http://oceania.wetlands.org

Fiji
PO Box S6, Superfresh, Tamavua, Suva, Fiji
Mobile: +679 9 255 425, Fax: +679 332 2413
E-mail: apjenkins@wetlands-oceania.org
Website: http://oceania.wetlands.org

SOUTHEAST ASIA

Indonesia
P.O.Box 254 / BOO
16002 Bogor, Indonesia
Tel.: +62 251 8312189
Fax: +62 251 8325755
E-mail: admin@wetlands.or.id
Website: http://www.wetlands.or.id

Project office in Southern Kalimantan
Jl. Menteng 25 No. 31
Palangka Raya 73112
Central Kalimantan, Indonesia
Tel.: +62- (0)536-38268
Fax: +62 (0)536-29058
E-mail: aluedohong@yahoo.com
Website: http://www.wetlands.or.id

Project office in Aceh
Jl. Persatuan 2 No 15, Desa Lambheu
Keutapang Dua, Banda Aceh, Indonesia
Tel.: +62 651 740 1981, Tel.: +62 811167027
Website: http://www.wetlands.id

Malaysia
3A39, Block A, Kelana Centre Point Jalan SS7/19
47301 Petaling Jaya, Selangor, Malaysia
Tel: +60 3 7804 6770, Fax: +60 3 7804 6772
E-mail: malaysia@wetlands.org.my
Website: http://malaysia.wetlands.org

Thailand
Prince of Songkla University
Faculty of Environmental Management
PO Box 95, Kor Hong Post Office
A. Hat Yai, Songkhla Province
90112 Thailand
Tel: +66 74 429307, Fax: +66 74 429307
E-mail: asae-s@psu.ac.th /
asaesayaka@yahoo.com

SOUTH ASIA

India
A-25, 2nd Floor
Defence Colony, New Delhi 110024, India
Tel.: +91 11 24338906, 32927908
Fax: +91 11 24338906
E-mail: wi.southasia@wi-sa.org
Website: http://south-asia.wetlands.org

EUROPE

Black Sea Region
PO Box 82, 01032 Kiev, Ukraine
Tel./Fax: +380 44 2465862
E-mail: kv@wetl.kiev.ua
Website: http://blacksearegion.wetlands.org

Russia
Postal address:
c/o WWF 232, FLIP-Post, Suite 25
176 Finchley Road
London NW3 6BT, United Kingdom
Visiting address:
Nikoloyamskaya Ulitsa, 19, Str. 3
Moscow 109240, Russia
Tel.: +7 495 7270939
Fax: +7 495 7270938
E-mail: oanisimova@wwf.ru
Website: http://russia.wetlands.org

France
Tour du Valat - Centre de recherche pour la conservation des zones humides méditerranéennes
Le Sambuc - 13 200 Arles, France
Tel.: +33 (0)4 90 97 20 13
Fax: +33 (0)4 90 97 20 19
E-mail: renaudin@tourduvalat.org
Website: www.wetlands.org

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